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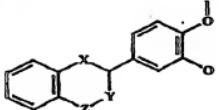
WO 02/091849 A1

(54) Title: A CHEWING GUM HAVING PROLONGED SENSORY BENEFITS

(57) Abstract: Chewing gums and methods of making same that have prolonged and enhanced sensory benefits are provided. The chewing gums of the present invention include a hydrophobic sweetener, a sensorially active component or trigeminal stimulant, such as a flavor, in addition to other typical chewing gum ingredients. The hydrophobic sweeteners are composed of sweet organic compounds that have a low water solubility.

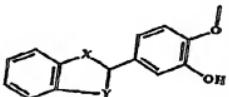
CLAIMS:

1. A chewing gum having prolonged sensory benefits comprising:  
 a water insoluble base portion;  
 a water soluble portion;  
 5 a sensorially active component; and  
 a hydrophobic sweetener having the formula selected from the group  
 consisting of



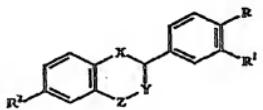
I

10 wherein X, Y and Z are selected from the group consisting of CH<sub>2</sub>, O  
 and S;



II

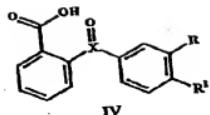
15 wherein X and Y are selected from the group consisting of S and O;



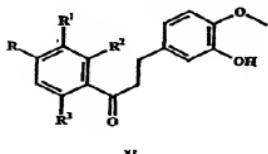
III

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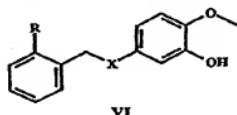
\* wherein X is S or O; Y is O or CH<sub>2</sub>; Z is CH<sub>2</sub>, SO<sub>2</sub>, or S;  
 R is OCH<sub>3</sub>, OH or H; R' is SH or OH and R' is H or OH;



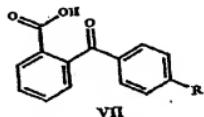
5 wherein X is C or S; R is OH or H and R<sup>1</sup> is OCH<sub>3</sub> or OH;



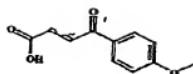
10 wherein R, R<sup>2</sup> and R<sup>3</sup> are OH or H and R<sup>1</sup> is H or COOH;



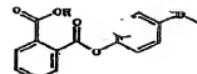
15 wherein X is O or CH<sub>2</sub> and R is COOH or H;



20 wherein R is CH<sub>3</sub>, CH<sub>2</sub>CH<sub>3</sub>, OH, N(CH<sub>3</sub>)<sub>2</sub> or Cl; and



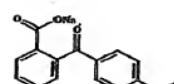
VIII



IX



X



XI

5

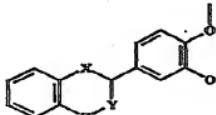
2. The chewing gum of claim 1 wherein the sensory benefits include flavor sensations, tingling, numbing, mouth coating, cooling/warming sensations, pain, itch or combinations thereof.

3. The chewing gum of claim 1 wherein the sensorially active component 10 is selected from the group consisting of a flavor, a cooling agent, a tingling agent, Jambu extract, Vanillyl alkyl ethers, Vanillyl n-butyl ether, spilanthol, Echinacea extract, Northern Prickly Ash extract, capsaicin, capsicum oleoresin, red pepper oleoresin, black pepper oleoresin, piperine, ginger oleoresin, gingerol, shogaol, cinnamon oleoresin, cassia oleoresin, cinnamic aldehyde, eugenol, cyclic acetal of 15 vanillin, menthol glycerin ether, unsaturated amides and combinations thereof.

4. The chewing gum of claim 3 wherein the cooling agent is selected from the group consisting of menthol, WS3, N-substituted p-menthane carboxamide, acyclic carboxamides, WS23, methyl lactate, Takasago Cooling agent, 3-1-menthoxypropane-1,2-diol, methyl succinate, menthous glycerol ketals and mixtures 20 thereof.

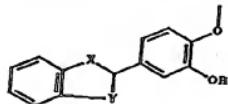
5. The chewing gum of claim 1 wherein the hydrophobic sweetener is in an amount ranging from about 50 Sucrose Equivalents to about 5000 Sucrose Equivalents.

6. A chewing gum having prolonged sensory benefits comprising a water insoluble base portion; a water soluble portion; a flavor; a plurality of additional sensorially active components; and a hydrophobic sweetener wherein the hydrophobic sweetener has the formula selected from the group consisting of 25



I

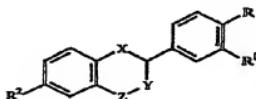
5 wherein X, Y and Z are selected from the group consisting of CH<sub>2</sub>, O and S;



II

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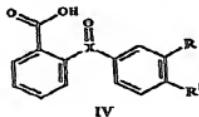
wherein X and Y are selected from the group consisting of S and O;



III

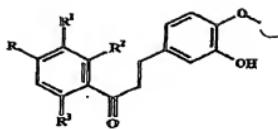
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wherein X is S or O; Y is O or CH<sub>2</sub>; Z is CH<sub>2</sub>, SO<sub>2</sub>, or S; R is OCH<sub>3</sub>, OH or H; R<sup>1</sup> is SH or OH and R<sup>2</sup> is H or OH;



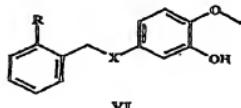
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wherein X is C or S; R is OH or H; R<sup>1</sup> is OCH<sub>3</sub>, or OH;



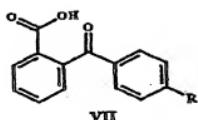
wherein, R<sub>1</sub>, R<sup>2</sup> and R<sup>3</sup> are OH or H and R<sup>1</sup> is H or COOH;

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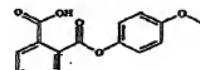
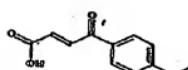
wherein X is O or CH<sub>2</sub>; and R is COOH or H;

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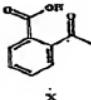


wherein R is CH<sub>3</sub>, CH<sub>2</sub>CH<sub>3</sub>, OH, N(CH<sub>3</sub>)<sub>2</sub> or Cl; and

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7. The chewing gum of claim 6 wherein the additional sensorially active components are selected from the group consisting of a cooling agent, menthol, WS3, N-substituted p-menthane carboxamide, acyclic carboxamides, WS23, methyl lactate, Takasago Cooling agent, 3-1-methoxypropane-1,2-diol, methyl succinate, menthone glycerol ketals, a tingling agent, Jambu extract, Vanillyl alkyl ethers, Vanillyl n-butyl ether, spilanthol, Echinacea extract, Northern Prickly Ash extract, capsaicin, capsicum oleoresin, red pepper oleoresin, black pepper oleoresin, piperine, ginger oleoresin, gingerol, shoagol, cinnamon oleoresin, cassia oleoresin, cinnamic aldehyde, eugenol, cyclic acetals of vanillin, menthol glycerin ether, unsaturated amides and combinations 10 thereof.

8. A method of producing a chewing gum exhibiting prolonged trigeminal effects comprising the steps of:

providing a plurality of chewing gum ingredients including a water insoluble base portion, a water soluble portion, a trigeminal stimulant and a hydrophobic 15 sweetener;

processing the ingredients; and

forming the chewing gum.

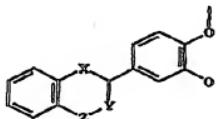
9. The method of claim 8 wherein the hydrophobic sweetener is in an amount ranging from about 50 Sucrose Equivalents to about 5000 Sucrose 20 Equivalents.

10. The method of claim 8 wherein the ingredients are processed by pre-mixing the hydrophobic sweetener with the trigeminal stimulant.

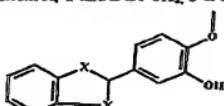
11. The method of claim 8 wherein the trigeminal stimulant is selected 25 from the group consisting of a flavor, a cooling agent, menthol, WS3, N-substituted p-menthane carboxamide, acyclic carboxamides, WS23, methyl lactate, Takasago Cooling agent, 3-1-methoxypropane-1,2-diol, methyl succinate, menthone glycerol ketals, a tingling agent, Jambu extract, Vanillyl alkyl ethers, Vanillyl n-butyl ether,

spilanthol, Echinacea extract, Northern Prickly Ash extract, capsaicin, capsaicum oleoresin, red pepper oleoresin, black pepper oleoresin, piperine, ginger oleoresin, gingerol, shogaol, cinnamon oleoresin, cassia oleoresin, cinnamic aldehyde, eugenol, cyclic acetal of vanillin, menthol glycerin ether, unsaturated amides and combinations thereof.

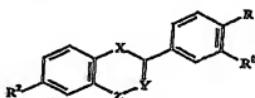
12. The method of claim 8 wherein the hydrophobic sweetener has a formula selected from the group consisting of:



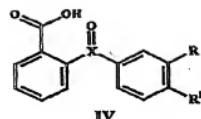
wherein X, Y and Z are CH<sub>2</sub>, O or S;



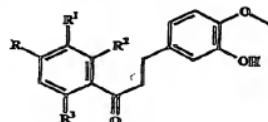
wherein X and Y are S or O;



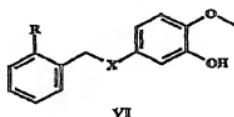
\*wherein X is S or O; Y is O or CH<sub>2</sub>; Z is CH<sub>2</sub>, SO<sub>2</sub>, or S; R is OCH<sub>3</sub>, OH or H; R' is SH or OH and R'' is H or OH;



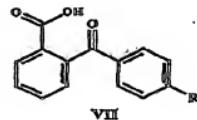
5 wherein X is C or S; R is OH or H; R' is OCH<sub>3</sub>; or OH;



10 wherein, R, R' and R'' are OH or H and R' is H or COOH;

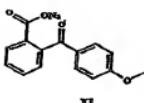
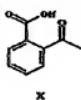
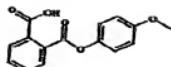
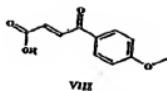


15 wherein X is O or CH<sub>3</sub>; and R is COOH or H;



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wherein R is CH<sub>3</sub>, CH<sub>2</sub>CH<sub>3</sub>, OH, N(CH<sub>3</sub>)<sub>2</sub> or Cl; and



13. A method for prolonging sensory benefits of a chewing gum comprising the step of chewing the chewing gum which includes a water insoluble base portion, a water soluble portion, a trigeminal stimulant and a hydrophobic  
10 sweetener including a sweet organic compound.

14. The method of claim 13 wherein the trigeminal stimulant is selected from the group consisting of a flavor, a cooling agent, menthol, WS3, N-substituted p-  
15 menthane carboxamide, acyclic carboxamides, WS23, menthol lactate, Takasago Cooling agent, 3-1-methoxypropane-1,2-diol, methyl succinate, menthone glycerol ketals, a tingling agent, Jambu extract, Vanillyl alkyl ether, Vanillyl n-butyl ether, spilanthol, Echinacea extract, Northern Prickly Ash extract, capsaicin, capsicum oleoresin; red pepper oleoresin, black pepper oleoresin, piperine, ginger oleoresin, gingerol, shogaol, cinnamon oleoresin, cassia oleoresin, cinnamic aldehyde, eugenol, 20 cyclic acetal of vanillin, menthol glycerin ether, unsaturated amides and combinations thereof.

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US08/18862

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
IPC(7) : 25 G 3/30 US CL : 422/3 According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols) U.S. : 426/3		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) NONE		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category <sup>a</sup>	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X —	US 4,013,801 A (DAWSON et al) 22 March 1977 (22.03.77), see entire document.	1-3, 8, 10-14
Y —		4-7, 9
X —	US 3,857,962 A (WESTALL et al) / December 1974 (31.12.74), see entire document.	1-3, 8, 10-14
Y —		4-7, 9
X —	US 3,821,417 A (WESTALL et al) 28 June 1974 (28.06.74), see entire document.	1-3, 8, 10-14
Y —		4-7, 9
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
<p><sup>a</sup> Special categories of cited documents</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document published on or after the international filing date which may throw doubt on priority claim(s) or which is cited to establish the publication date of another claimed or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>		
Date of the actual completion of the international search  16 AUGUST 2008	Date of mailing of the international search report  17 SEP 2008	
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20591 Facsimile No. (703) 505-9250	Authorized officer <b>ARTHUR L. CORBIN</b> Telephone No. (703) 508-0661	

Form PCT/ISA/410 (second sheet) (July 1998)\*

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US02/18862

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,236,721 A (CHU et al) 17 August 1993 (17.08.93), see entire document.	8, 10, 11, 13, 14
Y		9